

**II. REMARKS**

As an initial matter, Applicants renew their traversal of the Examiner's Restriction Requirement, outlined in the Office Action of July 12, 2007, for the reasons evinced in Reply (B), filed August 13, 2007, which is incorporated herein by reference. Furthermore, Applicants gratefully acknowledge the Examiner's determination that all generic claims and linking claims will be rejoined with allowed generic or linking claims (Office Action, dated September 25, 2007, at 2, lines 10-13).

Claims 2, 3, 6-11 and 14 have been withdrawn, and claims 1, 4, 5, 12, 13 and 15 have been examined.

Claims 1-12 and 15 have been amended. Specifically, independent claim 1 has been amended to improve grammar and punctuation, and to recite "a vertical axis z of a tool body of the precision machining tool" as supported on page 12, line 21, to page 13, line 17, and by Figure 4, of Applicants' disclosure as originally filed. Dependant claims 2-12 have been amended to improve grammar and not for a reason related to patentability. Therefore, the present amendment has no further limiting effect on the scope of claims 2-12. Claim 15 has been amended to improve grammar and so that it depends upon claim 13.

The present amendment adds no new matter to the above-captioned application.

**A. The Invention**

The invention pertains broadly to a free curved surface precision machining tool for precision-machining a surface to be machined, such as may be used to machine a surface. In accordance with an embodiment of the present invention, a free curved surface precision machining tool for precision-machining a surface to be machined is provided that includes the features recited by independent claim 1. Various other embodiments, in accordance with the present invention, are recited by the dependent claims.

An advantage provided by the various embodiments, in accordance with the present invention, is that a free curved surface precision machining tool for precision-machining a surface is provided that is capable of precision machining a free curved surface using a versatile 3-axis (x, z, r) machining apparatus.

**B. The Rejections**

Claim 15 stands rejected under 35 U.S.C. § 112, second paragraph, as indefinite.

Claims 1, 4, 5 and 12 stand rejected under 35 U.S.C. § 102(b) as anticipated by Nisimura (U.S. Patent 3,953,942, hereafter the “Nisimura Patent”).

Claims 5, 13 and 15 stand rejected under 35 U.S.C. § 103(a) as unpatentable over the Nisimura Patent in view of Kanda et al. (U.S. Patent 5,683,290, hereafter the “Kanda Patent”).

Applicants respectfully traverse the Examiner’s rejections and request reconsideration of the above-captioned application for the following reasons.

**C. Applicants’ Arguments**

In view of the present amendment, claims 1, 4, 5, 12, 13 and 15 are in compliance with 35 U.S.C. § 112.

**i. The Section 102(b) Rejection**

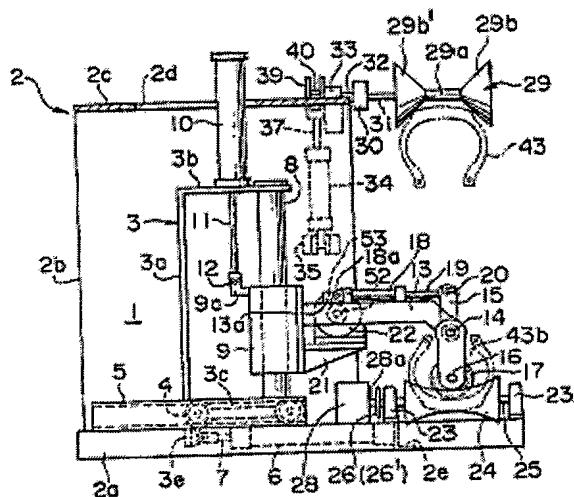
Anticipation under 35 U.S.C. § 102 requires showing the presence in a single prior art reference disclosure of each and every element of the claimed invention, arranged as in the claim. Lindemann Maschinenfabrik GMBH v. American Hoist & Derrick, 221 U.S.P.Q. 481, 485 (Fed. Cir. 1984). In this case, the Examiner has not established a prima facie case of

anticipation against Applicants' claimed invention because the Nisimura Patent does not teach, or suggest, each and every element of the claimed invention.

## ii. The Nisimura Patent

The Nisimura Patent discloses an “apparatus for grinding inner surface of a vehicle tire” that is used to grind the inner surface of a vehicle tire together with a mold releasing agent for amending an unbalanced portion on the tire and scars on the inner surface of the tire (See Abstract of the Nisimura Patent). The Nisimura Patent illustrates the apparatus for grinding an inner surface of a vehicle tire (43) in Figure 1, which is reproduced below.

FIG. 1



The Nisimura Patent discloses that the apparatus in Figure 1 comprises a frame structure (2), a horizontal supporting member (13) mounted on the frame structure (2), a swing member (15) pivotally mounted on the forward end portion of the supporting member (13), a grinder wheel (17) rotatably mounted on the lower end portion of the swing member (15), a swing member swinging mechanism (18, 19) mounted on the supporting member (13) for swinging the swing member (15) about its own axis, a grinder wheel rotating mechanism (See Figures 3 and 4) mounted on the supporting member (13) and the swing member (15)

for rotating the grinder wheel (17), a tire rotating mechanism (24, 25, 28) mounted on the frame structure (2) opposing to the grinder wheel (17) for holding and rotating the vehicle tire (43) at a predetermined peripheral speed, a grinder wheel moving mechanism (3, 6, 7) mounted on the frame structure (2) for relatively moving the supporting member (13) and the tire rotating mechanism (24, 25, 28) to move the grinder wheel (17) toward or away from the inner surface of the vehicle tire (43) on the tire rotating mechanism (See Abstract of the Nisimura Patent, and col. 3, line 37, to col. 6, line 39).

The Nisimura Patent does not teach, or even suggest, (i) “by rotation around a vertical axis z of a tool body of the precision machining tool” as recited by the preamble of independent claim 1. The Nisimura patent also does not teach, or suggest, (ii) “an orthogonal axis x orthogonal to the vertical axis z of the tool body” and (iii) “the drum-shaped tool has a convex machining surface in the form of an arcuate rotary body obtained by rotating an arc of radius r with the center of the arc at the intersection O between the vertical axis z and the orthogonal axis x around the orthogonal axis x” as recited by independent claim 1.

While the Examiner contends that Figures 3 and 4 of the Nisimura disclose the subject matter of Applicants’ claimed invention (Office Action, dated September 25, 2007, at 3, lines 8-10), Applicants point out that the mechanism shown in these figures pertains to the “driving connection” between electric motor (22) and the grinder wheel (17). Figures 3 and 4 of the Nisimura Patent are reproduced below for the Examiner’s convenience. While the subject matter disclosed by Figures 3 and 4 of the Nisimura Patent may be relevant to the subject matter of dependent claim 12, for example, it is not clear that the subject matter of Figures 3 and 4 otherwise pertain to the subject matter of independent claim 1. Likewise, the disclosure of the Nisimura Patent, at col. 6, lines 2-29, pertains to the “driving connection” shown in Figures 3 and 4. Therefore, while the Examiner has indicated the Nisimura Patent may disclose subject

FIG. 3

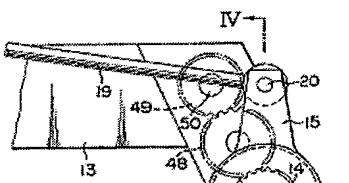
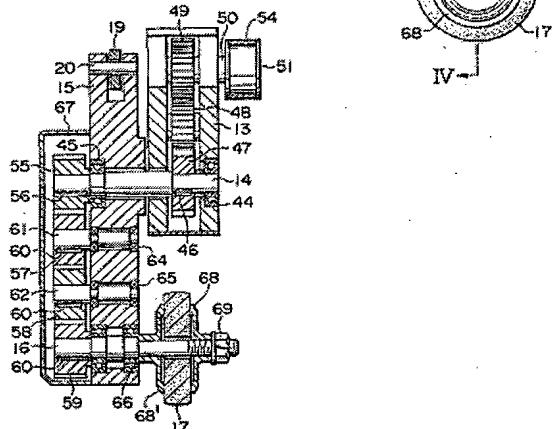


FIG. 4



matter pertaining to a “driving connection,” the Examiner has not shown that the Nisimura Patent discloses the subject matter recited by Applicants’ independent claim 1.

For all of the above reasons, the Examiner has not demonstrated a prima facie case of anticipation with respect to claims 1, 4, 5, 12, 13 and 15 of the present application.

### iii. The Section 103 Rejection

A prima facie case of obviousness requires a showing that the scope and content of the prior art teaches each and every element of the claimed invention, and that the prior art provides some teaching, suggestion or motivation, or other reason, for combining the references in the manner claimed. KSR International Co. v. Teleflex Inc., 127 S.Ct. 1727, 1739-41 (2007); In re Oetiker, 24 U.S.P.Q.2d 1443 (Fed. Cir. 1992). In this case, the Examiner has failed to establish a prima facie case of obviousness because the Examiner has not shown

that the combination of the Nisimura Patent and the Kanda Patent teach each and every element of the claimed invention.

**iv. The Nisimura Patent**

The disclosure of the Nisimura Patent has been discussed above, and Applicants have shown that the Nisimura Patent does not teach, or suggest, (i) “by rotation around a vertical axis z of a tool body of the precision machining tool,” (ii) “an orthogonal axis x orthogonal to the vertical axis z of the tool body” and (iii) “the drum-shaped tool has a convex machining surface in the form of an arcuate rotary body obtained by rotating an arc of radius r with the center of the arc at the intersection O between the vertical axis z and the orthogonal axis x around the orthogonal axis x” as recited by independent claim 1. As admitted by the Examiner (Office Action, dated September 25, 2007, at 4, lines 2-5), the Nisimura Patent does not teach, or suggest, (iv) that “the grindstone that includes a metal in a bonding material of the grindstone” as recited by claim 5, and (v) “correction means” as recited by claim 13.

**v. The Kanda Patent**

The Kanda Patent discloses an “apparatus for forming a convex tip on a workpiece,” such as shown in Figure 3 and which forms a hemispherical convex mirror surface on the end of a ferrule or optical fiber connector, wherein the apparatus includes a grinding wheel having a concave work surface, a tool for correcting the shape of the work surface, a stage for bringing the tool into contact with the wheel, a mechanism for causing the end of the ferrule to contact the work surface, and a mechanism for displacing the axis of the ferrule from the center of the curvature of the arcuate section of the work surface (See Abstract of the Kanda Patent). The Kanda Patent also discloses that after the axis of the ferrule has been displaced

from the center of the curvature, the ferrule is caused to contact the work surface and be roughly ground thereby, and that after the ferrule axis has been brought into alignment with the center of curvature, the ferrule is sequentially finished from the tip to a preselected point thereof (See Abstract of the Kanda Patent).

However, the Kanda Patent does not teach, or even suggest, (i) “by rotation around a vertical axis z of a tool body of the precision machining tool,” (ii) “an orthogonal axis x orthogonal to the vertical axis z of the tool body” and (iii) “the drum-shaped tool has a convex machining surface in the form of an arcuate rotary body obtained by rotating an arc of radius r with the center of the arc at the intersection O between the vertical axis z and the orthogonal axis x around the orthogonal axis x” as recited by independent claim 1.

**vi. Summary of the Disclosures**

Neither the Nisimura Patent nor the Kanda Patent, either alone or in combination, teach or suggest (i) “by rotation around a vertical axis z of a tool body of the precision machining tool,” (ii) “an orthogonal axis x orthogonal to the vertical axis z of the tool body” and (iii) “the drum-shaped tool has a convex machining surface in the form of an arcuate rotary body obtained by rotating an arc of radius r with the center of the arc at the intersection O between the vertical axis z and the orthogonal axis x around the orthogonal axis x” as recited by independent claim 1. In other words, according to the configuration of the claimed invention, the free curved surface precision machining tool precision-machines a surface to be machined with the convex machining surface that is in contact therewith by rotation around the vertical z axis and the convex machining surface is rotated around the orthogonal axis x so as to disperse the machining position of the convex machining surface.

For all of the above reasons, the Examiner has failed to establish a prima facie case of obviousness against the claims of the above-captioned application.

### **III. CONCLUSION**

Claims 1, 4, 5, 12, 13 and 15 are in compliance with 35 U.S.C. § 112.

Furthermore, the Examiner has failed to establish either a prima facie case of anticipation under 35 U.S.C. § 102(b), or of obviousness under 35 U.S.C. § 103(a), because neither the Nisimura Patent nor the Kanda Patent teach or suggest, either alone or in combination, (i) “by rotation around a vertical axis z of a tool body of the precision machining tool,” (ii) “an orthogonal axis x orthogonal to the vertical axis z of the tool body” and (iii) “the drum-shaped tool has a convex machining surface in the form of an arcuate rotary body obtained by rotating an arc of radius r with the center of the arc at the intersection O between the vertical axis z and the orthogonal axis x around the orthogonal axis x” as recited by independent claim 1.

For all of the above reasons, claims 1, 4, 5, 12, 13 and 15 are in condition for allowance, and a prompt notice of allowance is earnestly solicited.

Questions are welcomed by the below-signed attorney for Applicants.

Respectfully submitted,

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